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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,694	10/27/2003	Seung Min Lee	0465-1068P	2071

2292 7590 12/14/2005

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EXAMINER
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WHITTINGTON, KENNETH

ART UNIT	PAPER NUMBER
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2862

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/692,694

Applicant(s)

LEE ET AL.

Examiner

Kenneth J. Whittington

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5 and 10-12 is/are rejected.
- 7) ☒ Claim(s) 3,4,6-9 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

Bot Ledyh  
Primary Examiner

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

The Response filed November 7, 2005 has been entered and considered. In view thereof, the objections to the drawings and the rejection of claim 5 under 35 USC 112 are withdrawn.

6 ***Allowable Subject Matter***

Claims 3, 4, 6-9 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12 The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 3, 4 and 13, they have allowable subject matter for the reasons contained in the Office Action mailed July 5, 2005.

18 Regarding claim 6, the prior art does not show the combining of the maximum value of the magnetic field sensed by the auxiliary sensor with the SQUID signal and applying the combined value to the first feedback coil, in combination with the other features of the claim.

Regarding claim 7, the prior art does not disclose combining the output of the auxiliary sensor with the output of the SQUID to output a noise-eliminated signal, in combination

with the other features of the claim. Claims 8 and 9, based on their dependency, are allowed for the same reasons therefor.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not  
6 included in this action can be found in a prior Office action.

Claims 1, 2, 5, 10 and 11 are rejected under 35 U.S.C.  
102(b) as being anticipated by Keene et al. (US 6,339,328).

Regarding claim 1, Keene et al. discloses a SQUID apparatus comprising a SQUID sensing unit with a feedback coil (See Keene et al. FIG. 5, items 25b, 26b, 30a and 30b and see col. 6, lines  
12 15-22), an auxiliary sensor arrangement (See FIG. 5, items 25a and 26a, col. 3, lines 9-12 and col. 6, lines 15-22, note that Keene et al. contemplates an arrangement wherein a fluxgate is the auxiliary sensor), and a sensor reading unit for operating the SQUID and the auxiliary sensor to read out a signal of the SQUID and supplying the SQUID with feedback through a feed back  
18 coil (See FIG. 5, items 31, 32, 27a, 27b, 28a, 28b, and the ASPA discussed in col. 7, line 66 to col. 8, line 67). It is noted that since Keene et al. discloses the use of a SQUID sensor (See FIG. 5) and discloses using at least one fluxgate sensor, i.e., pick-up coil, as an auxiliary sensor, this auxiliary sensor has

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lesser sensitivity and greater operating range (See Keene et al. col. 11, lines 47-65).

Regarding claim 2, Keene et al. further discloses a driving unit for the SQUID (See FIG. 5, items 27b and 28b) and a driving unit for the auxiliary sensor (See FIG. 5, items 27a and 28a) and a first combining unit to combine the signals generated by the SQUID driver and the auxiliary sensor to supply the SQUID with an offset signal (See FIG. 5, item 31).

Regarding claim 5, Keene et al. discloses the sensor reading unit combining the output signal of the SQUID with a signal generated from a second feedback coil (See FIG. 5).

Regarding claim 10, Keene et al. discloses the auxiliary sensor being a pick-up coil, i.e., a fluxgate sensor. (See Keene et al. col. 3, lines 9-12).

Regarding claim 11, Keene et al. discloses a refrigerator for maintaining the SQUID sensor at a low temperature (See Keene et al. col. 11, line 66 to col. 12, line 10).

Claims 1 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Brake et al. (Improvement of the Performance of a  $\mu$ -metal Magnetically Shielded Room by Means of Active Compensation). Regarding claim 1, a SQUID apparatus comprising a SQUID sensing unit with a feedback coil (See page

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599, part 4, first paragraph), an auxiliary sensor arrangement having a lower magnetic field sensitivity and a higher operating range (See same paragraph, note that a pick-up coil is used as the auxiliary sensor), and a sensor reading unit for operating the SQUID and the auxiliary sensor to read out a signal of the SQUID and supplying the SQUID with feedback through a feed back coil (See same paragraph, and noted disclosure of feedback coils). It is noted that since Brake et al. discloses a SQUID and a pick-up coil in the manner as recited in the claims (claims 1 and 10), the pick up coil meets the properties recited in the claims.

12

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keene et al in view of Sata (US 5,343,707).

18 Keene et al. teaches all the limitations of claims 1 and 11 as discussed above. However, while Keene et al. teach using the sensor arrangement in a SQUID apparatus, it does not disclose features of the apparatus. Sata teaches a motor unit, a coolant for the compressor device and a cold end (See FIG. 3 and col. 7, line 1 to col. 8, line 65), and the SQUID being disposed away

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from the motor unit (See FIG. 3, item 31). It would have been obvious to incorporate the components as taught by Sata in the sensor arrangement of Keene et al. One having ordinary skill in the art would have been motivated to do so to provide the means for maintaining the SQUID sensor at low temperatures in a manner known in the art.

### ***Response to Arguments***

Applicant's arguments filed November 7, 2005 have been fully considered but they are persuasive in part. In response thereto, the rejections of claims 7-9 have been withdrawn. The arguments as to the remaining claims will be addressed in turn.

Regarding the rejection of claim 1 in view of Keene et al., Applicants have asserted that it is mere speculation in Keene et al. to use a SQUID sensor and another sensor type. However, a careful reading of Keene et al. and its claims reveals this is not just speculation, but specifically contemplated. As specifically disclosed and noted by Applicant, Keene et al. contemplates using four different sensors, i.e., SQUID, fluxgate, Hall probe or magneto-resistive magnetometers (See Keene et al. col. 6, lines 19-22 and col. 11, lines 47-65). Furthermore, Keene et al. notes that the fluxgate, Hall probe and magneto-resistive magnetometer devices are less sensitive

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and have a larger dynamic range (See col. 11, lines 47-65).

Finally, in the specification (col. 6, lines 19-22), Keene et al. explicitly states that the at least one sensor can be a SQUID sensor, thus Keene et al. at least contemplates a

situation where a single SQUID sensor is used in conjunction

6 with the other available sensors listed. This is confirmed in

wherein the claimed invention of Keene et al. requires that at

least one sensor is a SQUID magnetometer (See claim 9), which

specifically requires the situation where at least a single

SQUID is used in conjunction with the other available sensors.

To interpret otherwise would be to ignore the plain language of

12 the claims. Furthermore as noted above, these sensors are less

sensitive and have a higher dynamic range. Accordingly, Keene

et al. not only contemplates but explicitly discloses using a

SQUID sensor and a less sensitive auxiliary sensor.

Regarding Applicant's assertion that Keene et al. does not disclose the sensor reading unit as recited in the claims.

18 However, this claim is written in terms of the function of the

sensor reading unit with no real structure. Thus, such

limitation can be interpreted to encompass any feature or

features that perform the recited functions. Because the

multiple items cited in the rejection perform the recited



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functions, their integration forms the sensor-reading unit and accordingly discloses this feature.

Regarding Applicant's assertions with regard to claim 10 that because Keene et al. does not disclose a different type auxiliary sensor, it cannot disclose its such feature, Applicant  
6 is directed to the rejection and arguments relating to claim 1 above. Accordingly, Keene et al. discloses a pick up coil as recited in the claim.

Regarding the rejection of claim 1 in view of Drake et al., the only argument asserted by Applicant is that Drake et al. does not disclose providing the SQUID sensing coil with an  
12 offset magnetic field. However, the 11 turn coils disclosed in Drake et al. as being mounted around the top and bottom of the magnetically shielded room are designed to provide a compensating field, i.e., offset correction field. Accordingly, Drake et al. discloses this feature.

In view of the above comments, the rejections as noted  
18 above stand.

### *Conclusion*

Applicant's amendment necessitated the new ground of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is

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reminded of the extension of time policy as set forth in 37  
CFR 1.136(a).

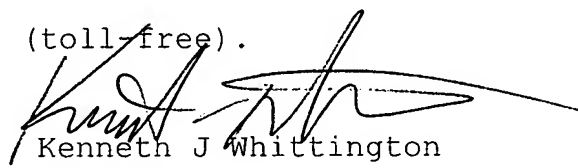
A shortened statutory period for reply to this final action  
is set to expire THREE MONTHS from the mailing date of this  
action. In the event a first reply is filed within TWO MONTHS  
6 of the mailing date of this final action and the advisory action  
is not mailed until after the end of the THREE-MONTH shortened  
statutory period, then the shortened statutory period will  
expire on the date the advisory action is mailed, and any  
extension fee pursuant to 37 CFR 1.136(a) will be calculated  
from the mailing date of the advisory action. In no event,  
12 however, will the statutory period for reply expire later than  
SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier  
communications from the examiner should be directed to Kenneth  
J. Whittington whose telephone number is (571) 272-2264. The  
examiner can normally be reached on Monday-Friday, 7:30am-  
18 4:00pm.

If attempts to reach the examiner by telephone are  
unsuccessful, the examiner's supervisor, Edward Lefkowitz can be  
reached on (571) 272-2180. The fax phone number for the  
organization where this application or proceeding is assigned is  
571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kenneth J Whittington  
Examiner  
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